

PATENT APPLICATION  
Docket No.: 2409.3273.2US



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Geoffrey S. Martin

Continuation Application of:

Serial No.: 481,169

Filed: June 7, 1995

For: **MULTIPLE LUMEN CATHETER**

Prior Examiner: Ronald K. Stright, Jr.

Prior Art Unit  
3306

## PRELIMINARY AMENDMENT

**BOX: PATENT APPLICATION**  
Honorable Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

Sir:

Prior to an examination on the merits of the above-referenced continuation application, kindly amend that application as follows:

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IN THE SPECIFICATION:

Page 1, lines 2-5, delete entirely and rewrite as follows:

--RELATED APPLICATIONS

PS 1/4/00  
PS 1/4/00  
PS 1/4/00  
PS 1/4/00  
PS 1/4/00  
This application is a continuation application of copending United States Patent Application Serial No. <sup>08/</sup>481,169 that was filed on June 7, 1995 (hereinafter "the Parent Application"), and that issued as United States Patent No. 5,797,869 on August 25, 1998. The Parent Application is a continuation application of United States Patent Application Serial No. <sup>08/</sup>205,331 that was filed on March 3, 1994 (hereinafter "the Grandparent Application"), and that issued as United States Patent No. 5,472,417 on December 5, 1995. The Grandparent Application is a continuation application of United States Patent Application Serial No. <sup>07/</sup>785,351 that was filed on October 30, 1991, (hereinafter "the Great-Grandparent Application") and that is now abandoned. The Great-Grandparent Application is a continuation application of United States Patent Application Serial No. <sup>07/</sup>288,364 that was filed on December 27, 1988 (hereinafter "the Great-Great-Grandparent Application"), and that issued as United States Patent No. 5,195,962 on March 23, 1993. This application is also related to United States Patent Application Serial No. <sup>07/</sup>699,421 that was filed on May 31, 1991, as a divisional application of the Great-Great-Grandparent Application and that issued as United States Patent No. 5,135,599 on August 4, 1992.--

PS  
Page 9, line 14, change "at" to } distal end 28 of catheter body 26 through a tip aperture 64 at the apex of--

PS  
Page 10, line 10, before the period (.) insert } , leaving a hollow extension A of

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Conclude

extraction lumen 50 distal of first insert 56--; and

line 22, after the period (.) insert the following sentence: ] A hollow

extension B of return lumen 52 remains distal of second

insert 60.--

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Page 11, line 19, after "mould" insert --68 in the direction of arrow D,--.

Page 14, line 13, change "sleeve" to --second sleeve 74--, and

after "expanded" insert --to form connector 30--; and

line 14, after "appearance" insert --of connector 30--.

Page 17, line 11, after "above" insert --with a tip opening 164,--.

Page 18, line 5, after "plug" insert --P--;

line 10, after "plug" insert --P--;

line 16, begin a new paragraph with "A further";

line 18, change "end of the extrusion" to ] distal end F of an extruded

B5

catheter body E, ] and

line 19, change "forming" to ] at one end of a central passageway G that

B6

forms--.

IN THE CLAIMS:

Cancel Claim 1.

Add the following new Claims 2 - 21:

*Sub  
Dict* 24 - 2. A triple lumen catheter comprising:

- B7*
- a. an outer tube having a proximal end and a distal end;
  - b. an inner tube having a proximal end and a distal end and defining therewithin a first lumen, said inner tube having an outer diameter less than the inner diameter of said outer tube, said inner tube being disposed within said outer tube to define an interior space between the outside of said inner tube and the inside of said outer tube;
  - c. a first septum extending from a first point on the outside of said inner tube to a first point on the inside of said outer tube;
  - d. a second septum extending between a second point on said outside of said inner tube and a second point on said inside of said outer tube, said first septum and said second septum thereby separating said interior space into a second lumen located on one side of said first septum, said inner tube, and said second septum, and a second lumen located on the opposite sides of said first septum, said inner tube, and said second septum;
  - e. a frustoconical distal tip section located at said distal end of said outer tube and enclosing said distal end of said inner tube, said outer walls of said tip section tapering radically inwardly to merge with said inner tube at said distal end thereof and terminate at an apex of said tip section through which said first lumen communicates with the exterior of said outer tube; and

f. plural openings formed through said outer tube at said distal end thereof through which each of said second lumen and said third lumen, respectively, communicate with the exterior of said outer tube.

Sub D<sub>25</sub> 2. A catheter as recited in Claim 1, wherein:

a. the lateral extent of said first septum measured between said first point on said outside of said inner tube and said first point on said inside of said outer tube defines the width of said first septum;

b. the lateral extent of said second septum between said second point on said outside of said inner tube and said second point on said inside of said outer tube defines the width of said second septum, and

c. said width of said first septum is substantially equal to said width of said second septum.

26 A. A catheter as recited in Claim 1, wherein said first septum and said second septum are coplanar.

27 ~~8.~~ A catheter as recited in Claim 2, wherein:

- a. the extent of said first septum measured normal to said width thereof defines the thickness of said first septum;
- b. the extent of said second septum measured perpendicular to said width thereof defines the thickness of said second septum; and
- c. said thickness of said first septum is equal to said thickness of said second septum.

28 ~~8.~~ A catheter as recited in Claim 4, wherein said thickness of said first septum and said thickness of said second septum are each about 0.010 inches.

29 ~~7.~~ A catheter as recited in Claim 1, wherein the thickness of the wall of said outer tube is greater than the thickness of the wall of said inner tube.

30 ~~8.~~ A catheter as recited in Claim 6, wherein:

- a. said thickness of said wall of said outer tube is about 0.013 inches; and
- b. said thickness of said wall of said inner tube is about 0.01 inches.

31 ~~8.~~ A catheter as recited in Claim 4, wherein said thickness of said first septum and said thickness of said second septum is equal to the thickness of the wall of said inner tube.

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10. A catheter as recited in Claim 4, wherein:

a. said thickness of said first septum is less than the thickness of the wall of said outer tube; and

b. said thickness of said second septum is less than said thickness of said outer tube.

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Cont

33 11. A catheter as recited in Claim 1, wherein the area of the transverse cross section of said second lumen is about 0.0048 square inches.

34 12. A catheter as recited in Claim 10, wherein the area of the transverse cross section of said second lumen is equal to said area of the transverse cross section of said first lumen.

35 13. A catheter as recited in Claim 1, wherein said outer tube, said inner tube, said first septum, and said second septum are integrally interconnected.

36 14. A catheter as recited in Claim 1, wherein the inside diameter of said outer tube is about 0.038 inches.

37 15. A catheter as recited in Claim 1, wherein the inner diameter of said inner tube is about 0.04 inches.

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38<sup>16</sup> A catheter as recited in Claim 1, wherein the outer diameter of said outer tube is about 0.149 inches.

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Cont  
39. 17.

A triple lumen catheter comprising:

a. a catheter body comprising:

i. an outer tube having a proximal end and a distal end;

ii. an inner tube having a proximal end and a distal end and defining therewithin a first lumen, said inner tube having an outer diameter less than the inner diameter of said outer tube, said inner tube being disposed within said outer tube to define an interior space between the outside of said inner tube and the inside of said outer tube;

iii. a first septum extending from a first point on the outside of said inner tube to a first point on the inside of said outer tube;

iv. a second septum extending between a second point on said outside of said inner tube and a second point on said inside of said outer tube, said first septum and said second septum thereby separating said interior space into a second lumen located on one side of said first septum, said inner tube, and said second septum, and a second lumen located on the opposite sides of said first septum, said inner tube, and said second septum;

b. a frustoconical distal tip section located at said distal end of said outer tube and enclosing said distal end of said inner tube, said outer walls of said tip section tapering radially inwardly to merge with said inner tube at said distal end thereof and terminate at an



apex of said tip section through which said first lumen communicates with the exterior of said outer tube; and

c. access means ~~attached~~ to said proximal end of said outer tube and said proximal end of said inner tube for providing fluid communication individually with said first lumen, said second lumen, and said third lumen.

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Substantive*  
40 ~~18~~. A catheter as recited in Claim 17, wherein each of said second lumen and said third lumen have a C-shaped transverse cross section.

41 ~~19~~. A catheter as recited in Claim 17, wherein said transverse cross section of said second lumen is congruent to said transverse cross section of said third lumen.

42 ~~20~~. A catheter as recited in Claim 17, wherein said access means comprises:

a. a connector attached to said proximal end of said outer tube and said proximal end of said inner tube;

b. a first access tube attached to said connector and communicating therethrough with said first lumen;

c. a second access tube attached to said connector and communicating therethrough with said second lumen; and

d. a third access tube attached to said connector and communicating therethrough with said third lumen.

43 <sup>21</sup> A method of manufacturing a triple lumen catheter, said method comprising the steps of:

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Conclude
- a. extruding a catheter body having a circular transverse outer cross section, said catheter body enclosing a longitudinally extending first lumen and a longitudinally extending second lumen separated by a generally planar septum having a bulbous middle portion projecting from one side of said septum into a said first lumen and from the other side of said septum into said second lumen;
  - b. forming a third longitudinally extending lumen within said bulbous portion of said septum;
  - c. tapering the outer wall of said catheter body inwardly at the distal end thereof into engagement with said bulbous portion of said septum;
  - d. terminating each of said first lumen and said second lumen proximal of said distal end of said catheter body; and
  - e. forming a first side opening through the outer wall of said catheter body to said first lumen; and
  - f. forming a second side opening through the outer wall of said catheter body to said second lumen.--

IN THE DRAWINGS:

Figure 2, add --64-- and an associated lead line to identify the tip aperture at distal end 28 of catheter body 26.

Figure 3, add --54-- and an associated lead line (two locations) to identify the intravenous lumen contained in septum 48;  
add --66-- and an associated lead line to identify the cylindrical wire that is disposed in intravenous lumen 54 during R.F. heating;  
add --A-- and an associated lead line to identify the hollow extension of extraction lumen 50 formed distal of first insert 56;  
add --B-- and an associated lead line to identify the hollow extension of return lumen 52 formed distal of second insert 60; and  
add --D-- in association with the heavy arrow pointing to the right and located on the left side of Figure 3 in order to identify the direction in which catheter body 26 is pushed into mould 68.

Figure 4, add --28-- and an associated lead line with an arrow to identify the distal end of catheter body 26 illustrated in the cross-sectional view provided;  
add --48-- and an associated lead line to identify the portion of the septum on the right side of intravenous lumen 54;  
add --56-- and an associated lead line to identify the first insert; and  
delete "50" and the associated lead line.

Figure 5, add --28-- and an associated lead line with an arrow to identify the distal end of catheter body 26 illustrated in the cross-sectional view provided;  
add --48-- and an associated lead line to identify the portion of the septum on

the left of intravenous lumen 54;

add --53-- and an associated lead line to identify the bulbous middle portion of septum 48;

add --A-- and an associated lead line to identify the hollow extension of extraction lumen 54 located distal of first insert 56 shown in Figure 3;  
and

add --B-- and an associated lead line to identify the hollow extension of return lumen 52 located distal of second insert 60 shown in Figure 3.

Figure 6, add --28-- and an associated lead line with an arrow to identify the distal end of catheter body 26 illustrated in the end view provided;

add --29-- and an associated lead line to identify the conical tapered tip at distal end 28 of catheter body 26; and

add --64-- and an associated lead line to identify the tip opening at distal end 28 of catheter body 26;

Figure 8, add --24-- and an associated lead line (two locations) to identify the wing tabs on either side of the figure.

Figure 10, add --30-- and an associated lead line with an arrow to identify the connector at the proximal end of catheter body 26.

Figure 11, add --30-- and an associated lead line with an arrow to identify the connector at the proximal end of catheter body 26.

Figure 13, add --126-- and an associated lead line with an arrow to identify the catheter body illustrated;

add --150-- and an associated lead line to identify the extraction lumen;

add --152-- and an associated lead line to identify the return lumen;

add --153-- and a pair of associated lead lines to identify each side of the bulbous middle portion of septum 48 illustrated in Figure 14;

add --154-- and an associated lead line to identify the intravenous lumen contained in bulbous middle portion 153 of septum 48;

add --156-- and an associated lead line to identify the first insert positioned in extraction lumen 150; and

add --164-- and an associated lead line with an arrow to identify the tip opening at distal end 128 of catheter body 126.

Figure 14, add --128-- and an associated lead line with an arrow to identify the distal end of catheter body 126 illustrated in the cross-sectional view presented;

add --148-- and an associated lead line to identify the septum;

add --153-- and an associated lead line to identify the bulbous middle portion of septum 148;

add --154-- an associated lead line to identify the intravenous lumen contained

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in bulbous middle portion 153 of septum 148;  
add 156-- and an associated lead line to identify the first insert disposed in  
extraction lumen 150 shown in Figure 13; and  
add --160-- and an associated lead line to identify the second insert disposed  
in return lumen 152 illustrated in Figure 13.

Figure 15, add --128-- and an associated lead line with an arrow to identify the distal end  
of the catheter body illustrated in the cross-sectional view presented;  
add --226-- and an associated lead line with an arrow to identify the catheter  
body illustrated; and  
add --254-- and an associated lead line to identify the intravenous lumen  
contained in septum 248.

Figure 16, add --P-- and an associated lead line with an arrow to identify the plug  
illustrated.

Figure 17, change "223" to --228--;  
add --E-- and an associated lead line with an arrow to identify the catheter  
body illustrated;  
add --F-- and an associated lead line with an arrow to identify the catheter  
body E; and  
add --G-- and an associated lead line with a double-ended arrow to identify

the central passageway in tip 216.

### REMARKS

#### A. Amendment to the Specification

The above-listed amendments to the specification include all amendments effected thereto during the prosecution of the Parent Application and serve the purpose exclusively of permitting the specification to refer with particularity to the figures in view of the several amendments that are also herein proposed to be effected in those figures.

None of the proposed amendments to the specification add new matter, and accordingly entry thereof is respectfully requested.

#### B. Amendments to the Claims

New Claims 2-21 are supported by the specification as originally filed.

Accordingly, entry thereof is respectfully requested.

#### C. Amendments to the Figures

The above-listed amendments to the figures include all amendments effected thereto during the prosecution of the Parent Application and serve to bring the figures as originally filed into conformity with the rules of patent practice in effect before the United States Patent and Trademark Office.

As those changes serve only to identify with reference characters structural features clearly shown in the drawings as originally filed, it is respectfully submitted that the above-listed amendments

to the drawings do not add new matter, and the approval of the Examiner for the entry thereof is respectfully requested.

For the convenience of the Examiner in this regard, transmitted herewith under cover of a Letter to the Official Draftsperson is a complete set of the figures as originally filed prepared in complete compliance with the formal requirements of the United States Patent and Trademark Office and containing all of the above-listed proposed amendments to those figures. In addition, transmitted therewith is an identical set of the figures with the proposed amendment thereto relative to the figures as originally filed highlighted in red.

D. Conclusion

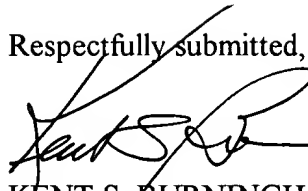
Accordingly, an examination on the merits is respectfully requested relative to Claims 2-21 newly presented herein.

Should the Examiner encounter any impediment to a prompt allowance of this application, and should that impediment be susceptible to resolution through a telephone conversation, the Examiner is respectfully requested to initiate such a telephone conference with the undersigned.



DATED this 25<sup>th</sup> day of August 1998.

Respectfully submitted,



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